



GRAIN INSPECTION, PACKERS AND STOCKYARDS ADMINISTRATION

Technical Services Division

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U.S. SOYBEAN INSPECTION

DEFINITION OF SOYBEANS

Soybeans are defined as: *Grain that consists of 50 percent or more of whole or broken soybeans (Glycine max (L.) Merril) that will not pass through an 8/64 round-hole sieve and not more than 10.0 percent of other grains for which standards have been established under the United States Grain Standards Act.*

Whole soybeans are soybeans with three-fourths or more of the soybean present. Other grains for which standards have been established are barley, canola, corn, flaxseed, oats, rye, sorghum, sunflower seed, triticale, and wheat.

CLASSES

Soybeans are divided into two classes based on color: Yellow soybeans and Mixed soybeans. There are no subclasses in soybeans.

Yellow Soybeans: Soybeans with yellow or green seedcoats that are yellow in cross-section and contains not more than 10.0% of Soybeans of Other Colors.

Mixed Soybeans: Soybeans that do not meet the color requirement for Yellow soybeans. By far the most predominant class is Yellow soybeans.

SPECIAL GRADES

Special grades identify unusual conditions in grain and are part of the grade designation. The soybean standards include three special grades:

Garlicky Soybeans. Soybeans that contain five or more green garlic bulblets or an equivalent quantity of dry or partly dry bulblets in a 1,000-gram portion.

Infested Soybeans. Soybeans that are infested with live weevils or other insects injurious to stored grain.

Purple Mottled or Stained Soybeans. Soybeans with pink or purple seed coats as determined on a portion of 400 grams with the use of an FGIS Interpretive Line Photograph.

SOYBEAN GRADING STEPS

STEP 1: Examine the sample for heating, odor, animal filth, castor beans, crotalaria seeds, garlic, glass, insect infestation, purple mottled and stained, smut, stones, unknown foreign substances, and other unusual conditions.

STEP 2: Determine the moisture content.

STEP 3: Determine the test weight per bushel of the sample.

STEP 4: Divide the sample into representative portions and determine the class, damaged kernels, heat-damaged kernels, foreign material, soybeans of other colors, and splits.

STEP 5: When requested by the applicant, determine the percentage of oil and protein on a foreign material free portion.

SOYBEAN GRADES AND GRADE REQUIREMENTS

Grade	Minimum test weight per bushel (pounds)	Maximum limits of--				
		Damaged kernels		Foreign material (percent)		Soybeans of other colors (percent) 1/
		Heat (percent)	Total (percent)			
No. 1	56.0	0.2	2.0	1.0	10.0	1.0
No. 2	54.0	0.5	3.0	2.0	20.0	2.0
No. 3	52.0	1.0	5.0	3.0	30.0	5.0
No. 4	49.0	3.0	8.0	5.0	40.0	10.0
<p>U.S. Sample grade:</p> <p>U.S. Sample grade is soybeans that:</p> <ul style="list-style-type: none"> (a) Do not meet the requirements for the grades U.S. Nos. 1, 2, 3, or 4; or (b) Contain 4 or more stones which have an aggregate weight in excess of 0.1 percent of the sample weight, 1 or more pieces of glass, 3 or more crotalaria seeds (<i>Crotalaria</i> spp.), 2 or more castor beans (<i>Ricinus communis</i> L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic foreign substance(s), 10 or more rodent pellets, bird droppings, or an equivalent quantity of other animal filth in a 1,000 grams of soybeans; or (c) Contain 11 or more animal filth, castor beans, crotalaria seeds, glass, stones, or unknown foreign substance(s) in any combination; or (d) Have a musty, sour, or commercially objectionable foreign odor (except garlic odor); or (e) Are heating or otherwise of distinctly low quality. <p>1/ Disregard for Mixed soybeans.</p>						

MOISTURE

While not a grading factor, moisture is determined on all soybean samples. The moisture content of grain is very important to its storability and can affect end-use.

TEST WEIGHT

The weight per Winchester bushel (2,150.42 cubic inches) as determined using an approved device according to procedures prescribed in FGIS instructions.

DAMAGED KERNELS

Soybeans and pieces of soybeans that are badly ground-damaged, badly weathered-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, insect-bored, mold-damaged, sprout-damaged, stinkbug-stung, or otherwise materially damaged. Stinkbug-stung kernels are considered damaged kernels at the rate of one-fourth of the actual percentage of the stung kernels.

FOREIGN MATERIAL

All matter that passes through an 8/64 round-hole sieve and all matter other than soybeans remaining in the sieved sample after sieving.

SPLITS

Soybeans with more than one-fourth of the bean removed and that are not damaged.

SOYBEANS OF OTHER COLORS

Soybeans that have green, black, brown, or bicolored seed coats. Soybeans that have green seed coats will also be green in cross section. Bicolored soybeans will have seed coats of two colors, one of which is brown or black, and the brown or black color covers 50 percent of the seed coats. The hilum of a soybean is not considered a part of the seed coat for this determination.

BASIS OF DETERMINATION		
Lot as a Whole	Factors Determined Before the Removal of Foreign Material	Factors Determined After the Removal of Foreign Material
Distinctly low quality Heating Infested Odor	Distinctly low quality Garlicky Heating Infested Kind of grain Moisture Odor Purple Mottled or stained Stones Test weight U.S. Sample grade factors	Heat-damaged kernels Damaged kernels Odor Soybeans of other colors Splits

OPTIONAL INSPECTION SERVICES

Other services also available for describing the quality and characteristics of soybeans are Protein and Oil content, aflatoxin, pesticide residues, seed sizing, seed count, white hilum, cracked seedcoats, shriveled and wrinkled, black soybeans, and sclerotinia..

PROCESSING THE WORK SAMPLE

